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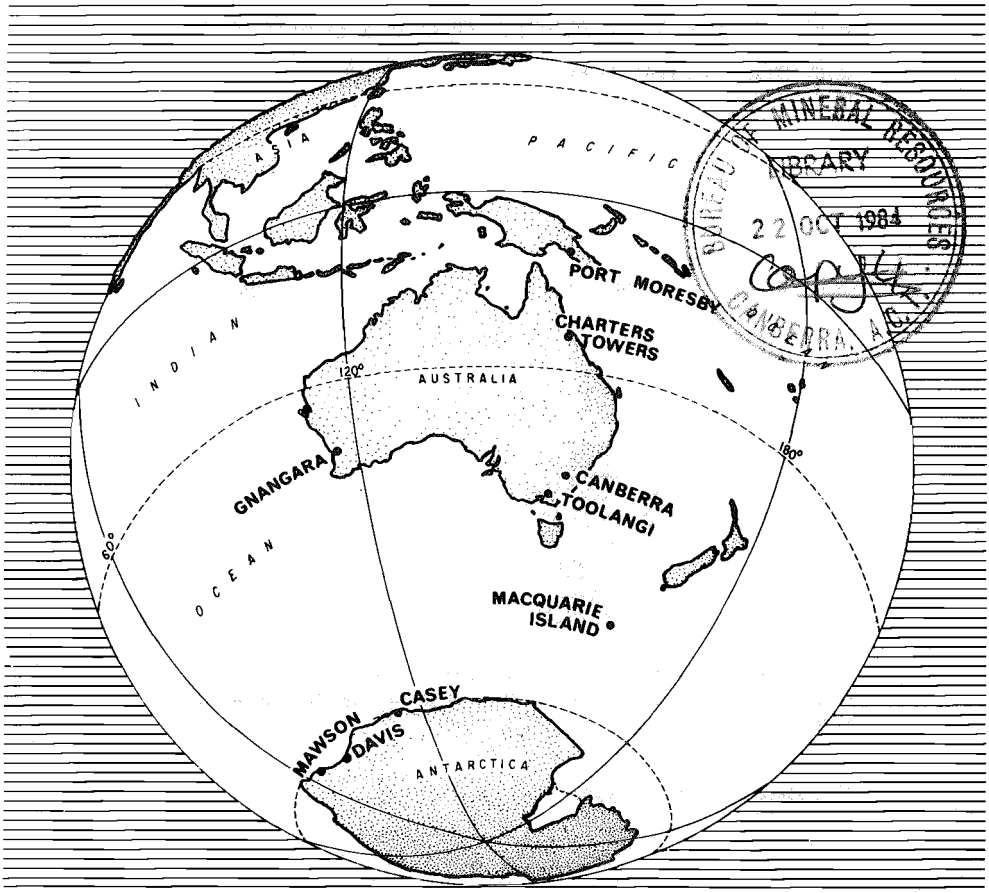

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MAGNETIC OBSERVATORIES

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VOLUME 32 NO. 5
MAY 1984
MINERAL RESOURCES, GEOLOGY & GEOPHYSICS

DEPARTMENT OF RESOURCES AND ENERGY

MINISTER: Senator The Hon. Peter Walsh

SECRETARY: A.J. Woods

BUREAU OF MINERAL RESOURCES, GEOLOGY & GEOPHYSICS

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The observers at Casey and Davis are officers of the Antarctic Division (Department of Science and Technology) and their contributions are gratefully acknowledged: they and the BMR geophysicists at Macquarie Island and Mawson are members of the Australian National Antarctic Research Expeditions (ANARE).

The data from the Port Moresby geophysical observatory are contributed by the Geological Survey of Papua New Guinea.

The terminology used in this report is that accepted by IAGA. The units of field intensity, nanotesla (nT), are those of the SI system. All times are in Universal Time. Should further information be required, apply to:

GEOMAGNETISM SECTION
BUREAU OF MINERAL RESOURCES
G.P.O. BOX 378
CANBERRA A.C.T. 2601

CONTRIBUTING OBSERVATORIES

OBSERVATORY	OBSERVER IN CHARGE	GEOGRAPHIC		GEOMAGNETIC	
		LAT	LONG	LAT	LONG
PORT MORESBY	I.D. Ripper	9°25'S	147°09'E	-18.6°	217.9°
CHARTERS TOWERS	J.M. Millican	20°05'S	146°15'E	-29.3°	218.4°
GNANGARA	P.J. Gregson	31°47'S	115°57'E	-43.3°	185.8°
CANBERRA	P.A. Hopgood	35°19'S	149°22'E	-44.0°	224.7°
*TOOLANGI	P.A. Hopgood	37°32'S	145°28'E	-46.7°	220.8°
MACQUARIE I	W.D. Prohasky	54°30'S	158°57'E	-61.1°	243.1°
MAWSON	P.G. Crosthwaite	67°36'S	62°53'E	-73.1°	102.9°
DAVIS	P.F.B. Williams	68°35'S	77°58'E	-76.7°	119.9°
CASEY	B.J. Whitely	66°17'S	110°32'E	-77.8°	179.1°

MAGNETOGRAPHS

OBSERVATORY	CODE	TYPE	ELEMENT/SCALE		VALUE
PORT MORESBY	PMG	La Cour (A)	H/3	D/5	Z/4
CHARTERS TOWERS	CTA	EDA/ELSEC digital (D1/1)			
GNANGARA	GNA	Eschenhagen (A)	H/3	D/7	Z/6
CANBERRA	CNB	Elsec digital (D1/0.1)			
TOOLANGI	TOO	La Cour (A)	H/5	D/6	Z/5
MACQUARIE I	MCQ	La Cour (A)	H/20	D/9	Z/21
MAWSON	MAW	La Cour (A)	H/21	D/13	Z/22

Scale values are in nT/mm
A = analogue, 20 mm/hr
D1/0.1,1 = digital, 1 min readings, 0.1 or 1 nT resolution

MAGNETOMETERS

Absolute data are based on observations made with QHM's BMZ's, fluxgate -theodolites, declinometers and proton precession magnetometers.

Errors in preliminary values obtained from magnetograms are not likely to exceed 5 nT or 0.5 minutes.

* Toolangi Observatory is only a variation observatory, since 1 July 1979.

TOOLANGI-CESSATION OF K-INDICES

Since mid-1979 the digital magnetic observatory established near Canberra in 1978 has replaced Toolangi as the reference observatory for south-eastern Australia. The scaling of K-indices at both observatories has continued in order to define the variation differences between the two locations.

Having now accomplished this, the scaling of K-indices at Toolangi will cease at the end of September 1984. A LaCour magnetograph will continue to record magnetic variations at Toolangi. Absolute observations will be made approximately annually.

PORT MORESBY

MAGNETIC K-INDICES - MAY 1984

Range for lower limit of K = 9 is 300 nT

Day	K-Indices								K-Sum
01	2	2	3	4	3	3	2	2	21
02	3	3	3	3	3	2	1	2	20
03	2	2	3	3	2	3	2	3	20
04	2	2	3	4	2	1	2	3	19
05	2	2	2	3	3	3	3	3	21
06	2	3	3	2	2	1	2	1	16
07	1	1	1	4	3	1	1	1	13
08	2	1	2	3	1	1	1	1	12
09	2	2	3	2	3	3	2	3	20
10	2	5	4	5	4	4	3	2	29
11	3	2	4	2	2	2	1	2	18
12	1	2	3	3	2	2	3	3	19
13	3	3	2	2	1	0	0	0	11
14	0	1	1	2	3	3	3	2	15
15	-	-	-	-	-	-	-	-	--
16	1	2	2	3	2	1	2	2	15
17	-	3	5	5	4	4	2	3	--
18	2	2	2	2	2	2	3	3	18
19	3	5	5	4	2	2	2	2	25
20	3	3	4	4	3	4	3	5	29
21	5	3	5	4	3	3	3	4	30
22	2	3	4	4	4	4	3	2	26
23	3	4	3	4	3	3	3	2	25
24	2	3	4	4	4	4	3	3	27
25	3	2	2	2	3	3	3	4	22
26	3	4	4	3	2	1	1	2	20
27	0	1	3	3	2	2	2	0	13
28	1	0	1	1	1	1	2	2	09
29	2	3	2	2	3	2	2	1	17
30	2	3	3	3	3	4	2	3	23
31	1	2	1	1	1	1	1	3	11

Mean of K-Sum is 19.4

Frequency of K-Indices

K:	0	1	2	3	4	5	6	7	8	9	-
f:	7	37	79	78	29	9	0	0	0	0	9

GNANGARA

MAGNETIC K-INDICES - MAY 1984

Range for lower limit of K = 9 is 450 nT

Day	K-Indices								K-Sum
01	2	3	3	5	5	5	3	2	28
02	2	3	3	3	3	1	0	0	15
03	1	1	2	2	2	2	3	2	15
04	2	1	2	4	2	1	2	2	16
05	2	1	2	3	4	4	5	3	24
06	3	3	2	1	1	1	1	0	12
07	0	0	0	2	2	0	0	1	05
08	1	0	2	1	0	0	0	1	05
09	2	1	2	2	3	3	2	4	19
10	2	3	3	3	4	4	2	1	22
11	2	2	3	1	2	1	2	2	15
12	1	1	2	2	1	2	2	3	14
13	3	2	2	0	0	0	0	0	07
14	0	0	0	2	2	3	3	2	12
15	2	1	2	2	2	1	1	0	11
16	1	1	1	2	1	0	1	2	09
17	3	3	3	5	3	3	2	2	24
18	2	1	1	2	2	2	3	3	16
19	3	4	4	2	2	3	3	1	22
20	2	2	3	4	3	5	4	3	26
21	4	3	4	4	3	3	4	4	29
22	3	3	4	4	4	5	3	3	29
23	4	3	4	5	3	4	4	3	30
24	2	3	3	4	5	4	4	2	27
25	2	1	2	1	3	3	4	4	20
26	2	3	3	1	2	1	0	0	12
27	0	0	2	2	2	2	1	1	10
28	1	0	0	0	1	1	2	2	07
29	1	2	1	2	3	3	2	2	16
30	3	2	2	4	2	4	4	3	24
31	1	1	0	1	0	0	0	3	06

Mean of K-Sum is 17.0

Frequency of K-Indices

K:	0	1	2	3	4	5	6	7	8	9	-
f:	33	46	74	56	30	9	0	0	0	0	0

CANBERRA

MAGNETIC K-INDICES - MAY 1984

Range for lower limit of K = 9 is 450 nT

Day	K-Indices								K-Sum
01	2	2	3	4	4	5	2	2	24
02	2	3	3	4	4	2	0	1	19
03	1	0	2	2	2	2	2	2	13
04	1	2	3	5	2	2	1	1	17
05	2	2	2	3	4	3	4	3	23
06	2	3	2	1	1	1	1	0	11
07	0	0	0	3	3	0	0	0	06
08	1	0	1	2	0	0	0	0	04
09	0	2	2	1	3	3	2	3	16
10	3	4	4	3	3	4	1	1	23
11	1	1	3	1	3	1	1	0	11
12	1	2	2	2	1	1	1	1	11
13	2	2	2	2	1	0	0	0	09
14	0	0	0	2	3	3	3	2	13
15	1	1	3	3	2	1	1	0	12
16	0	2	1	2	1	0	0	1	07
17	1	3	4	5	3	3	1	1	21
18	1	2	1	2	3	2	2	2	15
19	3	4	5	3	2	2	2	1	22
20	3	2	4	4	2	4	3	2	24
21	3	3	4	4	5	2	3	4	28
22	2	3	5	5	4	4	4	2	29
23	3	3	4	4	2	3	3	2	24
24	2	2	3	5	4	4	3	2	25
25	2	1	1	1	4	3	2	3	17
26	3	3	3	2	1	1	1	0	14
27	0	0	3	3	2	2	1	1	12
28	1	0	0	1	1	1	1	2	07
29	1	3	1	2	3	2	2	1	15
30	(3)	(2)	3	5	2	(3)	-	-	--
31	-	2	0	1	0	0	0	2	--

Mean of K-Sum is 16.2

Frequency of K-Indices

K:	0	1	2	3	4	5	6	7	8	9	-
f:	35	55	68	53	25	9	0	0	0	0	3

TOOLANGI

MAGNETIC K-INDICES - MAY 1984

Range for lower limit of K = 9 is 500 nT

Day	K-Indices								K-Sum
01	2	2	3	4	5	5	2	1	24
02	2	3	2	4	4	2	0	0	17
03	1	1	2	2	2	3	2	3	16
04	1	2	3	5	2	2	2	2	19
05	2	2	2	4	4	4	4	4	26
06	3	3	3	1	1	1	1	0	13
07	0	1	0	3	3	0	0	0	07
08	1	1	2	2	0	0	0	1	07
09	1	2	2	2	3	2	2	3	17
10	3	4	4	3	4	4	2	1	25
11	2	2	3	2	3	1	1	1	15
12	1	2	3	3	1	2	2	2	16
13	2	2	2	2	1	0	0	0	09
14	0	0	0	3	3	3	3	2	14
15	2	2	3	3	2	1	1	0	14
16	0	1	1	2	1	0	0	2	07
17	2	3	4	5	3	3	2	1	23
18	1	2	2	2	3	2	2	2	16
19	2	4	5	3	2	2	3	1	22
20	3	2	4	4	3	4	3	3	26
21	4	3	4	4	4	3	3	4	29
22	3	3	5	5	4	4	2	2	28
23	4	4	4	5	3	3	3	2	28
24	2	2	3	5	5	4	4	2	27
25	2	1	1	2	4	3	3	3	19
26	3	3	4	2	1	1	1	1	16
27	0	0	3	3	2	2	1	0	11
28	1	0	0	0	1	1	1	2	06
29	1	3	1	2	3	3	3	1	17
30	2	2	3	5	2	4	2	2	22
31	1	2	0	1	0	0	0	3	07

Mean of K-Sum is 17.5

Frequency of K-Indices

K:	0	1	2	3	4	5	6	7	8	9	-
f:	31	44	74	56	32	11	0	0	0	0	0

MACQUARIE ISLAND

MAGNETIC K-INDICES - MAY 1984

Range for lower limit of K = 9 is 1500 nT

Day	K-Indices								K-Sum
01	3	3	4	7	7	7	4	4	39
02	2	3	4	6	6	0	0	1	22
03	0	1	1	2	3	4	1	2	14
04	2	2	3	7	5	1	1	2	23
05	2	2	4	6	6	5	6	3	34
06	3	4	4	3	4	2	0	0	20
07	0	1	0	3	3	0	0	0	07
08	0	1	0	2	0	0	0	1	04
09	1	2	2	1	6	6	1	2	21
10	2	5	4	5	6	6	2	1	31
11	-	-	-	-	4	0	0	1	--
12	1	1	4	4	4	3	3	2	22
13	3	1	2	2	2	0	0	0	10
14	0	0	0	3	5	4	3	3	18
15	2	1	4	4	4	1	0	0	16
16	1	1	0	3	1	0	0	0	06
17	2	3	4	6	4	2	2	2	25
18	1	1	2	4	4	3	2	3	20
19	3	5	7	4	3	3	4	1	30
20	3	4	5	6	5	6	5	3	37
21	6	4	6	7	6	5	4	4	42
22	4	5	6	7	6	6	4	3	41
23	5	5	6	6	6	6	4	2	40
24	3	3	3	7	7	7	6	3	39
25	3	1	1	3	6	5	3	3	25
26	3	4	5	4	4	1	0	0	21
27	0	1	3	4	6	5	3	1	23
28	1	1	1	1	3	3	3	2	15
29	3	4	2	3	5	3	3	1	24
30	3	3	5	7	4	6	2	2	32
31	0	1	0	2	0	0	0	2	05

Mean of K-Sum is 23.5

Frequency of K-Indices

K:	0	1	2	3	4	5	6	7	8	9	-
f:	37	36	33	46	37	18	26	11	0	0	4

MAGNETIC K-INDICES - MAY 1984

Range for lower limit of K = 9 is 1500 nT

Day	K-Indices								K-Sum
01	5	5	5	4	5	5	6	6	41
02	6	5	4	5	3	3	1	1	28
03	1	1	5	4	2	3	6	6	28
04	4	4	4	5	3	1	4	7	32
05	4	4	4	4	3	6	7	7	39
06	6	4	5	4	3	1	1	1	25
07	3	1	1	1	3	1	1	3	14
08	2	2	3	2	2	2	1	1	15
09	1	3	3	2	3	3	5	7	27
10	6	7	6	5	3	4	3	3	37
11	4	3	4	2	3	3	6	6	31
12	5	2	3	4	2	2	4	3	25
13	5	5	4	2	2	1	0	0	19
14	0	2	0	1	3	4	7	4	21
15	4	3	5	4	3	2	3	2	26
16	3	3	3	1	2	1	1	5	19
17	5	6	4	5	3	3	2	3	31
18	3	4	3	2	2	2	5	6	27
19	5	7	5	5	3	4	4	5	38
20	6	5	6	5	3	7	7	6	45
21	6	6	5	5	4	4	6	7	43
22	6	5	6	5	3	6	4	7	42
23	7	6	5	5	5	4	7	7	46
24	4	4	5	5	5	5	6	6	40
25	7	3	4	3	4	4	7	8	40
26	6	7	5	4	3	1	2	1	29
27	0	0	3	4	2	4	4	4	21
28	4	3	2	2	2	2	4	6	25
29	4	5	3	3	3	3	3	6	30
30	6	5	5	4	2	3	6	6	37
31	4	3	3	1	1	1	1	6	20

Mean of K-Sum is 30.3

Frequency of K-Indices

K:	0	1	2	3	4	5	6	7	8	9	-
f:	6	27	28	50	46	41	32	17	1	0	0

MAY 1984

PRINCIPAL MAGNETIC STORMS

OBSERVATORY	COMMENCEMENT				SSC AMPLITUDES			MAX 3h INDEX K		RANGES				UT END	
	d	h	min	TYPE	D(')	H(nT)	Z(nT)	d (3h-PERIOD)	K	D(')	H(nT)	Z(nT)		d	h
PORT MORESBY	17	06	..	...	..	..	..	17 (3,4)	5	4	80	60		18	00
	19	..	..	...	..	..	..	19 (2,3)	5	7	130	50		23	00
								21 (1,3)							
CHARTERS TOWERS	17	03	..	...	..	..	..	17 (3,4)	5	7.4	86	31		17	21
	20	03	..	...	..	..	..	20(6)	5	8.2	131	26		22	18
								21(1,3)							
								22(3,4)							
GNANGARA					NIL										
CANBERRA					NIL										

MAY 1984

PRELIMINARY MONTHLY MEAN VALUES

OBSERVATORY	H	D	Z	F
	nT	° '	nT	nT
PORT MORESBY	35932	06 33.3E	-23712	43051
CHARTERS TOWERS	31781	07 41.8E	-38278	49753
GNANGARA	23267	03 18.7W	-53745	58565
CANBERRA	23714	12 18.1E	-53745	58745
MACQUARIE I	12632	29 03.0E	-63655	64896
MAWSON	18445	63 31.5W	-46412	49943
DAVIS	16572	76 45 W	-52391	54950
CASEY	9627	90 47 W		

The values are derived from magnetograms for selected quiet days except at Davis and Casey where they are derived from semi-weekly absolute measurements.

SUDDEN COMMENCEMENTS AND OTHER RAPID VARIATIONS

OBSERVATORY	DAY	TYPE AND QUALITY	TIME	SENSE AND AMPLITUDE OF CHIEF MOVEMENT		
				H(nT)	D(nT)	Z(nT)
PORT MORESBY	19	sfe	2151	+ 6	+ 2	+ 6
CHARTERS TOWERS	24	ssc*B	0844	+22	-13*	- 2
GNANGARA	24	ssc B	0845	+15	+15	+ 8
CANBERRA	24	ssc*B	0844	+22	-17*	+10

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